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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,508	02/27/2004	Gordon James Johnston Bartley	090936.0546	7422

31625 7590 02/23/2005

BAKER BOTTS L.L.P.  
PATENT DEPARTMENT  
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EXAMINER

STRICKLAND, JONAS N

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 02/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/788,508	<b>Applicant(s)</b> JOHNSTON BARTLEY ET AL.	
	<b>Examiner</b> Jonas N. Strickland	<b>Art Unit</b> 1754	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/04,4/04</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 9, 10, 12, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Yamaguro et al (US Patent 5,441,401).

Applicant claims a method of treating the NO<sub>x</sub> emissions from a diesel engine having a main fuel line that carries diesel fuel to the engine and a main exhaust line that carries exhaust from the engine, the method comprising the steps of: mixing a portion of diesel fuel from the main fuel line with air; receiving the mixed portion of diesel fuel and air into a partial oxidation unit; using the partial oxidation unit to partially oxidize the portion of diesel fuel into a gas mixture containing hydrogen; delivering the gas mixture to the main exhaust line; placing a hydrogen selective catalytic reduction unit in line on the main exhaust line, such that the hydrogen selective unit receives the exhaust and the gas mixture; and using the hydrogen selective catalytic reduction unit to convert the nitrogen oxides emissions into nitrogen.

Yamaguro et al. discloses an apparatus for decreasing nitrogen oxides in a combustion device, wherein the exhaust gas is discharged as a result of continuous combustion with hydrogen gas so that the nitrogen oxides can be removed by a catalytic reduction reaction with the purifying catalyst. The amount of hydrogen gas

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supplied need only be enough to reduce the nitrogen oxide content in the exhaust gas.

The hydrogen gas is obtained by modification of fuel water vapor and by a partial combustion process (col. 3, lines 20-39). Yamaguro et al. continues to disclose a partial oxidation unit (shift converter) operable to receive a portion of the fuel from the main fuel line to partially oxidize the fuel to produce a gas mixture containing hydrogen, and to deliver the gas mixture to the main exhaust line. Furthermore, a hydrogen selective catalytic reduction unit 5, located in-line on the main exhaust line, and downstream of the partial oxidation unit uses the hydrogen to continuously convert the NO<sub>x</sub> emissions in the exhaust line to nitrogen (col. 5, lines 21-57).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 2, 6, 11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguro et al. (US Patent 5,441,401) in view of Manohar et al. (US Patent 6,145,501).

Applicant claims with respect to claims 2, 6, 11 and 15, wherein the partial oxidation unit is comprised of a non-stoichiometric burner. The teachings of Yamaguro et al. have been discussed with respect to claims 1, 3, 9, 10, 12, and 18, but the reference does not teach wherein the partial oxidation unit is comprised of a non-stoichiometric burner.

However, Manohar et al. teaches a burner system having a catalyst body that supports a partial oxidation catalyst operative to catalyze the fuel in the primary air/fuel mixture to intermediate combustion species, such as hydrogen, thereby reducing emissions such as nitrogen oxides (see abstract).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Yamaguro et al., by using a non-stoichiometric burner as the partial oxidation unit in a process for reducing nitrogen oxides using hydrogen, because Manohar et al. teaches a process for reducing nitrogen oxides using hydrogen by partial

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oxidation, wherein the partial oxidation unit is comprised of a burner. Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art would have expected a process for reducing nitrogen oxides using hydrogen wherein the process is conducted by partial oxidation as taught by Manohar et al., to be similarly useful and applicable to a process for the partial oxidation catalytic operation for the reduction of nitrogen oxides in gas emissions.

7. Claims 4, 5, 8, 13, 14, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguro et al. (US Patent 5,441,401) in view of Yokota et al. (US Patent 5,543,124).

Applicant claims with respect to claims 4, 5, 8, 13, 14, and 17, wherein the partial oxidation unit is a nickel-based catalyst, a rhodium-based catalyst, and wherein the hydrogen selective catalytic reduction unit is platinum-based. The teachings of Yamaguro et al. have been discussed with respect to claims 1, 3, 9, 10, 12, and 18, but the reference does not teach wherein the partial oxidation unit is comprised of a nickel-based catalyst, a rhodium-based catalyst, and wherein the hydrogen selective catalytic reduction unit is platinum-based.

However, Yokota teaches providing a partial oxidation unit including catalyst, such as nickel and rhodium (co. 7, lines 12-17) and a reduction unit having a catalyst, such as platinum (col. 6, lines 13-19).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Yamaguro et al. in view of Yokota et al., by having a partial oxidation unit having a nickel-based catalyst, a rhodium-based catalyst, and wherein the

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hydrogen selective catalytic reduction unit is platinum-based, because Yokota teaches providing a partial oxidation unit including catalyst, such as nickel and rhodium (co. 7, lines 12-17) and a reduction unit having a catalyst, such as platinum (col. 6, lines 13-19). Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art, would have expected a process for partial oxidation as taught by Yokota et al., to be similarly useful and applicable to a process for partial oxidation as taught by Yamaguro et al.

8. Claims 7 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamaguro et al. (US Patent 5,441,401) in view of Murphy et al. (US Patent 6,122,909).

Applicant claims with respect to claims 7 and 16, wherein the hydrogen selective catalytic reduction unit is ruthenium based, which is not disclosed by Yamaguro et al.

However, Murphy et al. teaches providing a reduction unit having a catalyst, such as platinum and ruthenium for treating exhaust gases (col. 9, lines 12-17).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the teachings of Yamaguro et al., by utilizing a hydrogen selective catalytic reduction having a ruthenium base, since Murphy et al. teaches providing a reduction unit having a catalyst, such as platinum and ruthenium for treating exhaust gases. Such modification would have been obvious to one of ordinary skill in the art, because one of ordinary skill in the art, would have expected a process for treating exhaust gases as taught by Murphy et al., to be similarly useful to a process for treating exhaust gases as taught by Yamaguro et al., wherein both references utilize oxidation and reduction reactions, using hydrogen to treat the exhaust gas.

**Conclusion**


9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonas N. Strickland whose telephone number is 571-272-1359. The examiner can normally be reached on M-TH, 7:30-5:00, off 1st Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jonas N. Strickland  
February 16, 2005



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